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REPORT AND RECOMMENDATIONS

JUL 11 1967

of the

CURRENT SERIAL RECORDS

MARKETING RESEARCH ADVISORY COMMITTEE

Developed at its meeting in Washington, D. C. [4.76]
November 30-December 2, 1966

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PREFACE

The fourth annual meeting of the Marketing Research Advisory Committee was held in Washington, D. C., November 30-December 2, 1966. Assistant Secretary George L. Mehren, and Director of Science and Education is Chairman of the Committee. Earl Glover, Acting Deputy Administrator for Marketing in the Agricultural Research Service, is Vice Chairman.

Preceding the review of research programs Dr. Mehren discussed administrative and budgetary matters and described a newly formed intergovernmental food safety group including representation from the Food and Drug Administration and the Public Health Service, and explained related research, service, and regulatory activities. Dr. W. D. Maclay, Director, Research Program Development and Evaluation Staff, discussed the "National Program of Agricultural Research" which had recently been completed. Clarence H. Girard, Deputy Administrator for Regulatory Programs, Consumer and Marketing Service, discussed "Transportation and Freight Rate Developments." Rodney E. Leonard, Deputy Assistant Secretary for USDA Marketing and Consumer Services, discussed the report of the National Commission on Food Marketing. James Turnbull, Director, Current Research Information System, discussed the progress made to date on developing a new system for providing more effective management information on the total research programs of the USDA and States and to improve communication among scientists regarding research in progress.

Two statements containing suggestions for research were submitted to the Committee from the following:

The National Restaurant Association

The National Institute of Locker and Freezer Provisioners

As a basis for its recommendations and comments, the Committee made a systematic review of the Department's marketing research programs as summarized in research division progress reports made available to the Committee in advance of the meeting. The progress report material was supplemented by oral reports, visual materials, and discussion by program leaders from the following USDA research divisions and agency units: Market Quality Research Division and Transportation and Facilities Research Division, Agricultural Research Service; Marketing Economics Division, Economic Research Service; Standards and Research Division, Statistical Reporting Service; and marketing work of the Farmer Cooperative Service.

After careful review of the information available, and based upon current and future need for new knowledge, and the seriousness of problems faced by the industry, the Committee made the comments and recommendations included in this report to the Secretary of Agriculture.

Additional copies of this report may be requested from Max Hinds, Executive Secretary, Marketing Research Advisory Committee, Research Program Development and Evaluation Staff, U. S. Department of Agriculture, Washington, D. C. 20250

I. GENERAL COMMENTS

National Program of Research for Agriculture

The Committee was impressed with the National Program of Research for Agriculture as a tool for orienting and coordinating research at all levels and was pleased to learn that the same approach is being taken for agricultural extension.

National Commission on Food Marketing

We noted the frequent recognition and reference to the very useful report of the National Commission on Food Marketing, including both the majority and minority sections, and the auxiliary studies. We urge that USDA personnel use this information as a base for further research.

Better Understanding of Marketing

The Committee commends the Marketing Economics Division on its efforts to increase understanding of the marketing system through its movie, "Research Points the Way," and the book, "Agricultural Markets in Change."

Modern Concept of Marketing

The Committee expressed concern over the "farm gate" concept of marketing as applied to modern or future agricultural systems. The historical concept of agricultural marketing has been to treat as marketing everything that happens to farm products from the time they leave the farm until they reach the consumer. The concept has been with us from the days when the amount of processing which took place between the farm and the consumer was so small as to be negligible. In our present day economy there is much processing and manufacturing of agricultural products between the farm and the consumer. With the probable exception of agriculture, there is a nearly universal custom in economics and related fields, and among various practitioners who make use of economic analyses, to view marketing as a set of activities, or system, which provides time and place utility for commodities; whereas manufacturing or processing encompasses the activities that bring about changes in the form utility of commodities.

The background material provided to the Committee for review contained information showing that out of some \$83 billion for producing and distributing food -- about \$28 billion was for "growing the products" and the remaining \$55 billion was for "getting them from farm to the consumer." According to the best estimates, the average cost of processing and manufacturing food products is approximately 26% of the total. This is almost the same order of magnitude as the farm cost. Because the 26% figure is an average, it means that for some food products the manufacturing costs are already above the costs of the raw materials or semi-finished products at the farm gate. Also, as consumers become more affluent they purchase more services. Two farm products, eggs and wheat, offer an illustrative contrast to emphasize our concern about public understanding of marketing costs.

Shell eggs reach the consumer in the same form they left the farm. They have been stored and transported, but have not been processed. Wheat, on the other hand, is manufactured into flour and processed into bread before it reaches the consumer. In the interest of public understanding it would be helpful to know what proportion of the consumer price for bread was for manufacturing and processing. Such information would help explain the fact that the farmer's share of the consumer's dollar for eggs is much greater than for bread.

There is need to distinguish between movement and storage on the one hand, and processing and manufacturing on the other. The distinction between these functions is important in keeping the public properly informed about the marketing costs of farm commodities. In view of all this it would seem appropriate for the Department of Agriculture, in providing information to the general public, to take cognizance of the processing and manufacturing functions of changing the form utility of commodities, as distinct from the marketing functions of providing time and place utility.

II. GENERAL RECOMMENDATIONS

Allocation of Research Funds

The Committee is seriously concerned over the obvious imbalance in the allocation of USDA research funds between production and marketing. The rapidly changing marketing system, its importance to the food industry as indicated by the distribution of the consumers' food dollar and the many questions presently being raised concerning the efficiency of the food marketing system call for a redirection of departmental research effort giving much greater emphasis to marketing.

In applying the current budgeting approach to research programs in marketing, the particular group or segment of the economy whose costs and benefits are being measured is a very significant factor. When the general public welfare must be considered as an important output from research projects and programs "benefits" are very difficult to measure objectively and in all respects quantitatively. Yet the marketing benefits to the total population from studies of the vast American food industry are potentially tremendous and must not be overlooked in a possibly unduly narrow interpretation of "cost-benefit" ratios.

Systems Methodology

The Committee is distressed at the apparent lack of response to its 1965 recommendations regarding systems methodology in research and information procedures within the Department and repeats it here verbatim in the hope that it will be given the emphasis and attention we feel it merits:

Increased Emphasis on Systems Methodology. It is the recommendation of this Committee that a considerably increased emphasis be placed on systems methodology, to the extent of at least one man-year of a professional systems engineer. The purpose of this recommendation is:

- a. To eliminate duplication of effort by developing a formalized information system within the Research Program Development and Evaluation Staff, and formalized procedures for making a team approach to appropriate projects.
- b. To keep researchers abreast of methodology and techniques (e.g., computer programs and hardware) which may be relevant to their studies. The Committee observed several references to use of linear programming where, in its opinion, this technique was not necessarily the appropriate one for the problem under study, and it felt that such reference may have resulted from lack of personnel specifically charged with the area of applying systems methodology.

- c. To develop procedures for structuring individual research projects so that their various interfaces may be appropriately linked up to provide large-scale synthesis of findings to meet such important demands as those of the National Commission on Food Marketing and similar bodies. The emphasis here is on the need for compatibility, full utilization of findings, and the avoidance of gaps between closely related projects.

Research on Wholesale and Retail Food Operations

The Committee considers it a policy matter to support research in this area and repeats the recommendation made last year with a few modifications to bring it up-to-date.

It is the essence of public policy to provide the American people with all the benefits of vigorous competition, and in the area of food and agricultural products the maintenance of this competition is predicated on the economic health and well-being of the smaller, independent retail merchant and wholesaler. Historically, the research assistance and guidance provided by the United States Department of Agriculture research programs has helped such enterprises to maintain their competitive posture. This Committee feels that the continuation and enlargement of research services in the wholesale and retail food area is a matter that is directly connected with the public interest and the protection of consumers. It is understood that the objective of such a research program is not assistance to retailers and wholesalers, per se, but rather protection of the farmers' and consumers' interests through the most feasible approach and in a manner consonant with the Department's expressed objectives of its long-range study. This long-range goal is to develop an efficient food distribution program that will reduce the cost of food and therefore reduce inflationary pressure from this source.

In view of the recent public expressions in varying forms and localities with respect to food prices this Committee recommends that research in wholesale and retail food operations be given the highest priority.

Planning of Marketing Facilities

The Committee notes that a considerable proportion of the effort committed in this area has been expended in the form of professional services to assist communities in the development of plans for terminal wholesale markets. It is understood that this has been done in response to requests from the communities, and the practical benefits resulting from construction of the new market facilities have been considerable. The list of publications provided to us indicates that this type of assistance has been provided to some fifty different communities in the planning of new market facilities over the past several decades. The Committee is impressed by this evidence of practical payoff orientation. At the same time, the Committee notes that in the same list of publications there are only three titles listed since 1950 which imply subject matter (research results, data, etc.) that might have general applicability to the marketing facilities planning problem of any community. This bears out the impression gained from personnel working in this area that the requirements for manpower to meet demands from additional communities for assistance in their specific planning problems have left almost no resources for pursuit of the essential research functions of:

- a. exploring advanced technological and operational concepts which could substantially improve the effectiveness and efficiency of future terminal wholesale markets and related marketing facilities
- b. investigate advanced planning techniques (such as computerized simulations) for developing and evaluating alternative facilities plans and
- c. development and publication of generalized principles, procedures, and data which could be adapted and applied by any community in planning a facility to meet its specific requirements.

The Committee feels that in a technologically dynamic society such research cannot long be deferred or postponed without increasing risks that facilities planned in accordance with what was once the best known practice will in fact become technically and economically obsolescent before they are opened for business. Needless to say, if such a contingency should materialize it would jeopardize the fine reputation that has been established through past accomplishments in the community assistance phase of the work.

Therefore, in its capacity of advising on marketing research the Committee is impelled by the evidence at its disposal to make the following recommendations:

1. That the bulk of the resources in this area of work be directed to the functions outlined in paragraphs a, b, and c, above.
2. That professional assistance to communities in developing specific plans for marketing facilities be limited to applications which serve to demonstrate or test a new technological, operational, or planning concept or technique.

The Committee's position in this matter may be likened to that which one might take if an expansion of demonstration farms were encroaching on lands required for agricultural experiment stations. It should be emphasized that we are not unfavorably impressed by the community assistance aspect of the program, but we are disturbed by its continuing diversion of resources from the research functions. The suggestion is made that, if the Department considers it important to maintain the community assistance work at or near its present level for reasons not related to the research functions, it might then be possible to secure funding under some other portion of the budget.

III. ECONOMIC RESEARCH

Although descriptive research has value for understanding the future, the lasting values result from analytical-predictive research. It is recommended that research in economics of marketing be directed toward the analytical-predictive as opposed to descriptive. Greater emphasis should be given to location and growth economics even if it requires some shifting from the investigation of the competitive situation of input and output marketing firms.

The Committee was informed of the progress and status of the away-from-home eating survey being conducted with matching funds from industry. The Committee supports continued effort to follow through with the results of this survey and translate these in a meaningful way to the industry.

The Marketing Economics Division has recognized the major research needs in its area of responsibility. Obviously, not all of the areas needing additional research can be adequately covered in the coming year or even in several years. It is, therefore, suggested that a definite priority list be set up indicating where additional resources will be utilized. The following is suggested:

1. Location and Transportation Economics. Locational advantages existing in most respects for decades are suddenly being diminished by differential rates of change in transport methods and costs, and differential rates of regional economic growth. Transportation of agricultural products is in such a state of flux that studies should be continued in areas of plant location, sale and leaseback of equipment, alternate forms of transportation, and justification for hauling farm commodities without Federal regulation even if it involves backhaul of nonfarm commodities. Transportation rate levels and rate structures are being altered radically and rapidly. This has had and will continue to have differing impacts on different areas of the country. The USDA is continually asked to represent agricultural interests. In this capacity it needs research results indicating the potential effects of proposed rail rate actions. The impact of these changes should be given high priority as a means of providing insight into probable effects of further potential changes.
2. Evaluating Effects of Group Actions on Market Performance. There is considerable interest at the present time in the potential benefits of group action by farmers. Some work on this has already been done pertaining to marketing orders. The results of this work should be published and further study initiated.
3. Innovation and Economic Growth. The Committee recognizes that imbalance may be created in the marketing system by innovation and economic growth. Research should be conducted on the interrelationship of these factors and their influence on marketing costs and competition with agricultural products.
4. Developing Improved Measures of Market Performance. The validity of the statistics available on performance of the marketing system is sometimes questioned. These statistics are widely used and should be appraised and improved where necessary. The "market basket" concept for measurement should probably be refined from its present definition as a kind of "white collar" and middle-income abstraction to one applicable also to those consumers who fall at the level defined as the

poverty level. If the poor pay more in their neighborhoods and in marginal areas without supermarkets, and their dietary knowledge and habits are different from those of the middle-income group, then these data should be reflected in the statistics for a typical poor man's "market basket."

5. Pricing in an Integrated Market. Integration is one of the major developments in agriculture in the last decade. In some sectors -- such as broilers -- it has encompassed large segments of the industry. This has seriously upset traditional price discovery mechanisms. New pricing methods need study for understanding and possibly correction.
6. Responsiveness of the Marketing System to Changes in Consumer Demand. In view of much increased articulation of consumer criticism of the adequacy of response by the retail food industry, in particular, to consumer needs and demands, a number of new lines of research are needed to identify the various causes of the criticism. Related research in this area conducted by the Standards and Research Division, Statistical Reporting Service, would provide up-to-date information about the continually changing tastes and preferences of consumers. This information would enable decision-makers in the marketing system to adjust quickly and efficiently to these changes as they occur.

Cooperative Marketing

The balance of allocation of professional man-years appears good, however, funds for new fields such as assisting low-income rural people improve their income through cooperatives should come from added appropriations rather than be shifted from ongoing research funds. Highest priority should be given to studies which should lead to mergers of local cooperatives and of regional or national cooperatives.

Studies on the changing structure and performance of grain marketing should not be delayed in view of the rapid increase in concentration in the grain exporting business. Research is needed on the costs and benefits of on-farm versus cooperative elevator storage of grain in anticipation of the need for substantial increase in receiving and handling facilities, particularly grain drying facilities, resulting from changing grain harvesting equipment and methods. Also, research is needed to assist cooperative oil mills, compresses, and cotton marketing associations make adjustments that will be necessary under the anticipated decline in cotton production. Further research is needed to determine the impact of technical and economic changes in agricultural production and feed milling on cooperatives that manufacture and distribute feed and how such cooperatives might make needed adjustments.

Pooling, a basic form of orderly marketing and marketing agreements, needs more research before these marketing techniques are applied to additional commodities. Likewise, educational materials directed to the farmer need to be prepared if he is to develop muscle in the marketplace such that the farm shows a return on investment and for farm family labor more nearly in line with industry.

Research is needed to determine costs and benefits of changes in market structure and of various integrated livestock marketing programs including costs and benefits of each major segment of such integrated programs such as livestock feedlots and slaughter and processing plants.

Research is needed to determine the benefits growers might realize by extending their processing and marketing of fruits, vegetables, and rice; procuring and marketing seed; and the most efficient combinations of production credit and marketing services for poultry cooperatives should be provided poultry producers.

Research is needed to determine geographic areas that offer the greatest potential from coordinated marketing by dairy and egg marketing cooperatives and to evaluate potential growth effectiveness and methods of coordinating such marketing programs. Also, research is needed to provide a base for more orderly and effective consolidation of operations of fruit and vegetable cooperatives.

A study should be made of number, types, and operating characteristics of motor trucks and other transportation equipment owned or leased by farmer cooperatives.

Current agricultural policy is to develop the most effective means of utilizing present food programs in meeting the food needs of the poor. The "know how" of USDA in the field of organization and management of cooperatives has a potential in cooperation with the Office of Economic Opportunity for the development of retail cooperatives among the poor. Information is needed about the availability, eligibility, criteria, and participation of the needy in present or prospective programs, and the potential for meeting the unfilled needs. In addition to the possibilities inherent through such cooperative planning to deal with serious problems in poverty areas, such activities would provide constructive enterprises for local groups.

IV. MARKET QUALITY RESEARCH

Food Safety. The Committee believes that still greater emphasis should be placed by the Market Quality Research Division's professional staff on food safety matters. The market quality scientists should participate with other departments and agencies in the forthcoming studies on salmonella in animal products. The knowledge and experience of the Market Quality Research Division on the effects of plant sanitation, equipment, and handling could contribute greatly to solving the problem. There is a need for surveys of the bacteriological contamination in agricultural growing areas, industrial plants, transportation, warehousing, distribution, and retailing. The determination of tolerance levels will lead to practical approaches such as new sanitizing agents, improved equipment design, and handling and processing methods. These types of studies will enable the Department to continue to keep abreast of food safety hazards and exert their usual leadership to protect the public. Organized studies along these lines will produce factual information and place this subject on a scientific basis so the problem can be viewed from a rational rather than an emotional basis. In addition, work must be continued on pesticide residues, antibiotic residues, and other bacteriological studies.

European Laboratory. The work on market quality would be strengthened and be still more productive to the agricultural industries with the establishment of a European pilot market laboratory. This would enhance the work of all the agencies of the Department. At the present time it is not possible to accurately determine the quality of the various commodities arriving overseas, nor the effects on quality resulting from pesticide applications, packaging, handling methods, and the transportation cycle.

Prompt Activation of Program at New Facilities. One of the problems in getting a program underway at a new facility is to have the appropriate balance between physical facilities, equipment, and staff as early as possible. In order to allow the various laboratories to carry out projects at optimum efficiency, we urge that USDA be given greater flexibility to use funds interchangeably to recruit necessary personnel and acquire equipment in advance of completion of facilities where such leadership and equipment will result in having a program underway as soon as possible upon completion of the facilities.

Instrumentation and Pioneering Laboratory Activities. Industry must look to the Department of Agriculture and the universities to perform the basic research fundamental to the agricultural segments of the economy. The Committee urges the Department to expand these activities. This will result in findings having numerous applications to future food and fiber industrial developments.

Stored-Product Insects. The Committee believes that still greater emphasis should be placed on biological control of stored-product insects. Because insecticides are frequently applied to harvested grains and seeds, it is particularly important to determine the fate and effect of these pesticide residues during storage and up to the time these commodities are consumed by man and/or animal. The waiting period between the application of the pesticide and the consumption of the commodity is much shorter for these postharvest applications and therefore could be much more dangerous to the consumers. After a careful review of major projects being undertaken, the Committee believes that enough emphasis is being given to the other projects dealing with stored-product insects.

Interdisciplinary Research at Clay Center, Nebraska. Last year the Committee recommended that fundamental research in meats should be continued and that provision should be made for carrying out applied phases of the market quality program at the U.S. Meat Animal Research Center being established near Clay Center, Nebraska. The Committee is concerned that no action on this recommendation has been taken and repeats that the market quality research program should be a part of the program of the U. S. Meat Animal Research Center.

Improved Methods of Identifying Salmonella. The Committee is encouraged by the research results that have been obtained by this project --the reduction of a 96-hour test to 48 hours. In view of the urgency for making salmonella surveys, further reduction in test time would be desirable and application of the work done thus far should be expedited.

Maintenance of Quality of Grains, Seeds, Oilseeds, and Forages during Storage. More research is needed on the biological and physiological aspects of seed storage. This information will be particularly important in foreign countries as part of their program to advance their own agricultural capabilities. In order to develop the necessary information, it will be necessary to employ additional cereal chemists and pathologists. In view of the losses sustained during overseas shipments of the various grains and seeds, ranging up to 40%, the expenditures for these scientists would be recovered many times.

Quality Maintenance of Eviscerated Poultry. Research in this area should be expanded in view of the threat to the industry from salmonella contamination.

Market Quality of Fruits and Vegetables Harvested by Machine. The shortage of farm and field labor has greatly accelerated the development and use of mechanical harvesting equipment for a wide range of fruits and vegetables. There is a continuing need to support the agricultural engineering phases of mechanical

harvesting. In addition, there is need to expand research on market quality to determine the nature and degree of physical damage done to the products for both the fresh and the processed markets. The basic physical and biological changes that account for this damage need to be established so that proper steps can be developed for reducing or eliminating the damage.

Quality of Apples and Pears. Studies are needed to determine the effect of climatic, seasonal and environmental factors on maturity and storage of apples and pears. Additional information is needed about the factors that contribute to physical breakdown. It would be desirable to carry out these studies concurrently in several geographic areas, for example, the Pacific coast, the Midwest, Michigan and Virginia.

V. TRANSPORTATION AND FACILITIES RESEARCH

Improved Coordination of Transport Services. Costs and efficiency in marketing agricultural and food products depend to a large extent upon how effectively the transport requirements of the physical distribution system are met. Poor coordination of the services of the different transport modes lowers the utilization rates for equipment and facilities, increases transport costs, and delays marketing and processing schedules. Operations research techniques can provide the necessary information to determine the most efficient means of coordinating the services of the different transport modes to meet the needs of the marketing system. Research should be undertaken to identify areas in which improved coordination of transport services is feasible for agricultural products and farm supplies and to find ways to achieve such improvement.

Air Transport of Agricultural Products. The Committee again recommends that research should be undertaken to find ways to use the new technology to do a better job of transporting farm products, but with particular emphasis on that portion of our previous recommendation that specific effort be made to secure matching funds and active cooperation from the air transport industry.

Multipurpose Vehicles. The Committee is pleased to learn of progress in research in this critical area and recommends that the new work be maintained at an accelerated pace and that results be made known to industry as soon as possible, including any interim information which may be available at the present time.

Cryogenic Refrigeration and Atmosphere-Control Technology in Transport. Recent developments in the use of cryogenics for refrigeration and atmosphere-control technology have made it necessary for shippers, receivers, and transporters to choose among a larger number of ways of protecting perishable food products in transport and handling. Lack of adequate cost and performance data for the new techniques makes it difficult to choose the best means of protecting products on the way to market. Research should be undertaken to develop economic-engineering data for more effective shipper decisions and to develop packages, shipping containers, transport equipment, and techniques that will improve the performance and lower the cost of cryogenic refrigeration and atmosphere-control methods.

Storage of Food Products. Research should be initiated to evaluate the various types of available warehousing, both public and private. This evaluation should include the effect of storage location on lead time and freight costs for moving food products to a distribution warehouse. Also, research should be initiated to evaluate the techniques and potentials for automated warehousing. The initial emphasis of this research should be to determine which functions in

grocery warehousing are susceptible to automation and which should be given highest priority. This research is needed in order to provide plans for warehousing facilities of proper dimensions to accommodate the equipment needed for automated warehousing.

Systems Study of the Meat Industry. Previous research has provided information that contributed to improvements in livestock auctions, stockyards, transportation, packinghouse facilities, equipment and methods, meat wholesaling facilities and equipment, cutting and packaging meat for retail at central plants and retail meat departments. Research to be undertaken in F.Y. 1967 will determine the feasibility of assembling all of these marketing functions into an optimum livestock and meat marketing system. A full-scale analysis of the problem should be undertaken if the preliminary study shows its feasibility. It is implicit that the analysis use the "systems approach" and that by this is meant the use of such techniques as constructing models, testing alternatives, etc.

Automated System for Handling Sales Data on Livestock Markets. The approximately 1,725 livestock auction markets in the U. S. process sales data in practically the same way now as in the early 1930s. Sales data are recorded and transferred manually from the arena to the market office and office personnel make all computations and prepare the necessary records and accounts including the seller's checks. Excessive labor costs in data transmission, processing, and record-keeping are common. The Committee recommends that research be undertaken to develop an automatic sales transmitting, processing, and recording system to increase the efficiency of the selling operation, minimize the possibilities for man-made errors in computation, speed up payments for animals following their sale, and reduce total labor requirements.

Study of Turkey Eviscerating Process. Over fifty percent of the labor required to prepare turkeys in ready-to-cook form is expended in the eviscerating operation. Frequently at peak production rates the eviscerating line crew is out of balance because one or more of the operations is slowing other operations on the line. This results in a costly production bottleneck and inefficient use of labor. Evaluation of work methods for improving crew balance and improvement of equipment used in the eviscerating operation would provide needed assistance to turkey processors and should be undertaken, drawing upon the research already undertaken in chicken processing.

Automatic Checkout Counters. Research on automatic checkout counters is still the prime need for the retail food industry and present funds are not adequate to do the study. The checkout bottleneck is the key to better inventory control, store records and lower overall retail costs. The hardware has been developed that can apparently do the job but extensive experimentation, testing, and cost analysis is necessary before the method becomes practical. The USDA is ideally situated to conduct these tests where various components are assembled and tested to develop the best combinations for a complete checkout and information system. We recommend that funds be allocated and the necessary research undertaken.

Food Service. Improved operational productivity and reduced food distribution costs in restaurant operations are recognized as key factors in holding back price increases to consumers. The Committee recommends that research on cafeterias should be continued in depth, concentrating on those areas where studies to date have indicated the greatest potential for cost-savings. Also, research should be initiated to develop information that would lead to more efficient operations in service-type restaurants.